



US005533571A

United States Patent [19]**Surjaatmadja et al.**[11] **Patent Number:** **5,533,571**[45] **Date of Patent:** **Jul. 9, 1996**[54] **SURFACE SWITCHABLE
DOWN-JET/SIDE-JET APPARATUS**

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OTHER PUBLICATIONS[75] Inventors: **Jim B. Surjaatmadja**, Duncan, Okla.;
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B. Kabinoff**, Bakersfield, Calif.[73] Assignee: **Halliburton Company**, Duncan, Okla.[21] Appl. No.: **250,412**[22] Filed: **May 27, 1994**[51] Int. Cl.⁶ **E21B 21/00; E21B 34/14**[52] U.S. Cl. **166/222; 166/318**[58] Field of Search **166/222, 223,
166/318, 332, 317; 175/237, 331, 317**[56] **References Cited****U.S. PATENT DOCUMENTS**

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Kennedy[57] **ABSTRACT**

A surface switchable down-jet/side-jet apparatus. The apparatus comprises a housing with a valve sleeve slidably disposed therein. When the valve sleeve is in a first position, fluid pumped into the apparatus will be jetted out of at least one longitudinally directed port. An actuator, such as a ball, is dropped into the apparatus to seat on the valve sleeve, and when pressure is applied thereto, forces the valve sleeve downwardly, shearing a shear pin. The valve sleeve is moved downwardly to a second position in which at least one transverse port in the housing is uncovered and the longitudinal port is closed. Additional fluid pumped into the apparatus is jetted radially outwardly through the transverse port.

6 Claims, 2 Drawing Sheets